FROM

TRANSACTIONS

OF THE

NEW ZEALAND INSTITUTE,

VOLUME 55, pp. 392-396.

SECOND SUPPLEMENT TO THE UREDINALES OF NEW ZEALAND.

BY

G. H. CUNNINGHAM,

Mycologist, Department of Agriculture, Wellington, N.Z.

ISSUED 30TH JULY, 1924.

WELLINGTON, N.Z.:
W. A. G. SKINNER, GOVERNMENT PRINTER.

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Second Supplement to the Uredinales of New Zealand.

By G. H. Cunningham, Mycologist, Department of Agriculture, Wellington, N.Z.

[*Read before the Wellington Philosophical Society, 24th October, 1923; received by Editor, 31st December, 1923; issued separately, 30th July, 1924.*]

Since Parts 1 and 2 of "The Uredinales, or Rust-fungi, of New Zealand" were published (*Trans. N.Z. Inst.*, vol. 54, pp. 619–704; *ibid.*, vol. 55, pp. 1–58, 1924) the following additional species and hosts have come to hand:—

1. Uromyces Edwardsiae n. sp.* (Fig. 128.) Leguminosae.

0. Spermogones unknown.

III. Teleutosori on pods which have become converted into distorted, rugulose, inflated, piriform galls, attaining a size of 40 × 18 mm.†; chocolate, pulverulent, covering the entire surface, naked. Teleutospores broadly elliptical, less commonly obovate, 30–40 × 22–26 mmm.; apex rounded or bluntly acuminate, slightly (3–4 mmm.) thickened, base attenuate or rounded; epispore 2–3 mmm. thick, conspicuously longitudinally reticulate, with, in addition, a few coarse warts near the apex, pallid chestnut-brown; pedicel deciduous, hyaline, up to 15 × 6 mmm.; germ-pore apical, conspicuous, frequently crowned with a tinted papilla.

Host: *Edwardsia tetraptera* (J. Miller) Oliver (= *Sophora tetraptera* J. Miller). On pods. Herb. No. 1234. III. Tahakopa, Catlins (Southland), 70 m., *C. M. Smith!* March, 1923. (Type.)

The host is indigenous and widespread; it occurs also in Lord Howe Island, Easter Island, Juan Fernandez, and Chile (Cheeseman, 1906, p. 123).

The fungus attacks the pods shortly after flowering, causing them to become distorted and much inflated. In place of the normal pod, 5–20 cm. long, a short piriform gall is formed in its stead. The surface of the gall is much wrinkled and covered with the masses of chocolate-coloured sori. The epispore of the teleutospore is covered with distinct reticulations, arranged in parallel rows which converge at the poles This character separates this from every other species occurring on the genera *Edwardsia* and *Sophora*.

No less than six species of *Uromyces*, and two of the form-genus *Aecidium*, have been recorded as occurring on these two genera, as under:—

II, III. *Uromyces hyalinus* Peck. America. Leaves and stems.
II, III. *U. shikokianus* Kus. Japan. Leaves.
III. *U. cladrastidis* Kus. Japan. Leaves.
III. *U. truncicola* P. Henn. et Shirai. Japan. Stems.
II, III. *U. Sophorae-japonicae* Diet. Japan. Leaves.
II, III. *U. Sophorae-flavescentis* Kus. Japan. Leaves.
I. *Aecidium Sophorae* Kus. Japan. Leaves.
I. *A. kowhai* G. H. Cunn. New Zealand. Stems.

The majority of these species of *Uromyces* possess verruculose teleutospores, but none have the peculiar reticulations so noticeable in our species; the gall-forming habit, and habitat on pods, are also characteristic features.

Particulars as to the Japanese species have been obtained from a recent paper by Ito (1922).

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* Latin diagnoses are placed at the end of the paper.

† In this article the contraction "mmm." is used for micromillimetres.

2. Puccinia heketara n. sp. (Fig. 129.) Compositae.

0. Spermogones unknown.

I. Aecidia hypophyllous and caulicolous; on leaves aggregated into irregular closely-packed groups on distorted spots, visible on the upper surface as discoloured areas; on stems scattered over irregular inflated areas which may attain a length of 25 mm., bright orange. Peridia embedded or slightly erumpent, cupulate, 0·5 mm. diam., margin lacerate, slightly reflexed, standing above the leaf-surface about 0·25 mm. Spores elliptical or obovate, 25–35 × 18–22 mmm.; epispore moderately and finely verrucose, 2 mmm. thick, hyaline; cell-contents orange, vacuolate.

III. Teleutosori hypophyllous, seated on minute spots which may or may not be visible on the upper surface, chocolate-brown, circular or irregular in outline, up to 1 mm. diam., frequently less, erumpent, pulverulent. Teleutospores elliptical, 45–55 × 20–26 mmm.; apex rounded

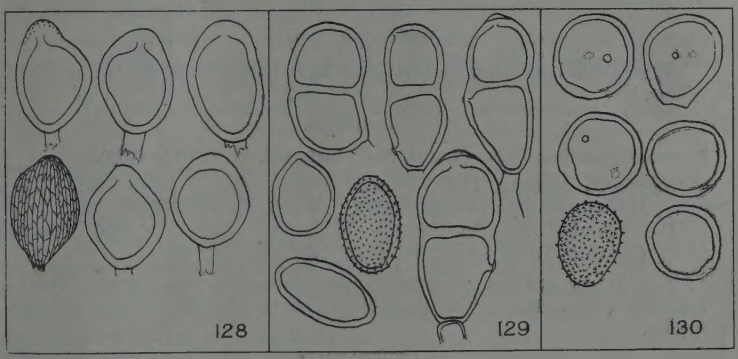

FIG. 128.—*Uromyces Edwardsiae* n. sp.
FIG. 129.—*Puccinia heketara* n. sp.
FIG. 130.—*Uredo Forsterae* n. sp.

or bluntly acuminate, not or slightly (3 mmm.) thickened, base attenuate, lower cell slightly longer and narrower than the upper; constricted at the septum; epispore smooth, 1·5–2 mmm. thick, pallid chestnut-brown, cell-contents vacuolate; pedicel deciduous, hyaline, stout, up to 25 × 8 mmm.; germ-pore of the upper cell apical, basal pore between one-third and two-thirds below septum, both conspicuous and papillate.

X. Mesospores rare, obovate, 28–40 × 16–23 mmm.

Host: *Olearia Cunninghamii* Hook. f. On leaves, petioles, and stems. Herb. No. 1244. I–III. York Bay (Wellington), 100 m., *E. H. Atkinson!* (Type.)

The host is endemic, and abundant throughout the North Island and lowland forests of Marlborough and Nelson (Cheeseman, 1906, p. 286).

This rust closely resembles *Puccinia Atkinsonii* G. H. Cunn. (on *Olearia excorticata* Buch.), but differs in many minor characters, especially in the non-retuse apex, thinner epispore, and smaller size of the teleutospores.

3. **Uredo Forsterae** n. sp. (Fig. 130.) Candolleaceae.

II. Uredosori hypophyllous, on irregular yellow spots, scattered, elliptical, 1–2 mm. long, dark chestnut-brown, bullate, pulverulent, surrounded by the ruptured epidermis. Uredospores globose to obovate, 24–31 × 18–25 mmm.; epispore finely bluntly and moderately echinulate, chestnut-brown, 1·5–2 mmm. thick, with 2–3 obscure equatorial germ-pores.

Host: *Forstera Bidwillii* Hook. f. On leaves. Herb. No. 1272. II. Mount Egmont (Taranaki), 1,000 m., *E. H. Atkinson!* 2 Feb., 1923.

The host is endemic, and distributed through the mountain-ranges of both Islands (Cheeseman, 1906, p. 393).

These three species bring the total of species collected in New Zealand to 124, this number being distributed in the following genera: *Uromyces*, 14; *Uromycladium*, 4; *Puccinia*, 68; *Gymnoconia*, 1; *Phragmidium*, 5; *Hamaspora*, 1; *Coleosporium*, 1; *Melampsora*, 2; *Melampsoridium*, 1; *Pucciniastrum*, 1; *Milesina*, 1; *Aecidium*, 11; *Uredo*, 14.

ADDITIONAL HOSTS.

These hosts have come to hand since the publication of the two previous papers.

Gramineae.

Puccinia graminis Pers. (*Trans. N.Z. Inst.*, vol. 54, p. 644, 1923).

Agropyron scabrum (Lab.) Beauv. On culms. Herb. No. 1273. III. Queenstown (Otago), 500 m., *W. D. Reid!* 5 June, 1923.

Poa aquatica L. On leaves. Herb. No. 740. II, III. Araraki (Hawke's Bay), 35 m., *G. H. C.* 22 Feb., 1922.

The former host is indigenous and widespread, and occurs also in Australia (Cheeseman, 1906, p. 923). The latter host is an introduced species.

Cyperaceae.

Puccinia Caricis Schroet. (*l.c.*, p. 649).

Carex appressa R. Br. On leaves. Herb. No. 367. III. Bluff (Southland), sea-level, *W. D. Reid!* 26 May, 1922.

The host is endemic, and confined to the South, Stewart, and several of the outlying islands (Cheeseman, 1906, p. 814).

Puccinia Unciniarum Diet. et. Neg. (*l.c.*, p. 650).

Uncinia australis Pers. On leaves. Herb. No. 597. II, III. Pencarrow (Wellington), sea-coast, *E. H. Atkinson!* 21 Jan., 1923.

The host is indigenous, and not uncommon throughout the lowland areas; it is said to occur in the Sandwich Islands (Cheeseman, 1906, p. 802).

Polygonaceae.

Puccinia tiritea G. H. Cunn. (*l.c.*, p. 654).

Muehlenbeckia axillaris (Hook. f.) Walp. On leaves. Herb. No. 1274. II, III. Ettrick (Otago), 300 m., *G. H. C.* 24 March, 1923.

The host is indigenous and widespread; it occurs also in Tasmania and Australia (Cheeseman, 1906, p. 593).

ONAGRACEAE.

Puccinia pulverulenta Grev. (*l.c.*, p. 665).

Epilobium junceum Sol. On leaves. Herb. No. 593. II, III. Shore of Lake Taupo (Auckland), 400 m., *E. H. Atkinson!* 9 March, 1922.

Epilobium pictum Petrie. On leaves. Herb. No. 508. II, III. Cass (Canterbury), 800 m., *W. D. Reid! N. R. Foy!* 19 Jan., 1922.

Epilobium pubens A. Rich. Herb. No. 1275. II, III. Wakatipu (Otago), 400 m., *W. D. Reid!* 5 June, 1923.

E. junceum is indigenous and abundant throughout both Islands, and occurs also in Australia; *E. pictum* is endemic and confined to the mountain regions of the South Island; *E. pubens* is indigenous and abundant throughout, and occurs also in Australia (Cheeseman, 1906, pp. 174–76).

COMPOSITAE.

Puccinia fodiens G. H. Cunn. (*l.c.*, p. 682).

Celmisia spectabilis Hook. f. Herb. No. 750. II. Mount Waiopehu (Wellington), 1,700 m., *G. H. C.* 26 Oct., 1919. Sugarloaf, Cass (Canterbury), 1,000 m., *W. D. Reid! N. R. Foy!* 20 Jan., 1922. Waiouru–Tokaanu Road, Taupo, 1,000 m., *E. H. Atkinson!* 13 March, 1922.

Puccinia novae-zelandiae G. H. Cunn. (*l.c.*, p. 686).

Olearia arborescens (Forst. f.) Cockayne and Laing (= *Olearia nitida* Hook. f.). On leaves. Herb. No. 790. I. Mount Egmont (Taranaki), 1,000 m., *E. H. Atkinson!* 4 Feb., 1923.

Olearia avicenniaefolia (Raoul) Hook. f. Herb. No. 600. I, III. Franz Josef Glacier (Westland), 250 m., *W. D. Reid!* 28 June, 1922.

Both hosts are endemic, *O. avicenniaefolia* being confined to the South and Stewart Islands, *O. arborescens* being abundant throughout (Cheeseman, 1906, pp. 285, 291).

CORRECTION.

Miss E. M. Wakefield in a recent letter has pointed out that *Puccinia Hoheriae*, described as new on page 661, *Trans. N.Z. Inst.*, vol. 54, has already been published by her in the *Kew Bulletin*, the species being named from material forwarded to Kew in 1917 by A. H. Cockayne. This species should therefore be cited—

P. Hoheriae Wakef., *Kew. Bull. Misc. Inf.*, p. 312, 1917.

Syn. *P. Hoheriae* G. H. Cunn., *Trans. N.Z. Inst.*, vol. 54, p. 661, 1923.

I am indebted to Miss Wakefield for drawing my attention to this matter.

LATIN DIAGNOSES.

Uromyces Edwardsiae sp. nov. (Fig. 128.)

0. Incognitis.

III. Soris teleutosporiferis in sufflatis, rugosis siliquae sedere; ad 40 × 18 mm., brunneo-nigris, pulverulentibus, nudis. Teleutosporis late ellipticis v. obovatis, 30–40 × 22–26 mmm.; apice rotundato v. acuminato, leniter 3–4 mmm. incrassato, basi attenuato v. rotundato; episporio reticulato, 2–3 mmm. crasso, castaneo; pedicello deciduo, hyalino, ad 15 × 6 mmm.; foramine germinis apicale, conspicuo, saepe papillato.

Hab.: In siliquae *Edwardsiae tetrapterae* (J. Miller) Oliver. Tahakopa, Southland, New Zealand, 70 m. *C. M. Smith.*

Puccinia heketara sp. nov. (Fig. 128.)

0. Incognitis.

I. Aecidiis hypophyllis et caulicolisque, in magnis catervis in maculis detorsis quae desuper cerni possunt solide confertis, ad 25 mm. longis, irregularibus, luteis. Peridiis immersis v. leviter erumpentibus, cupulatis, ad 0·5 mm. diam., marginibus laciniatis, leniter incurvatis. Aecidiosporis ellipticis v. obovatis, 25–35 × 18–22 mmm.; episporio minute verrucoso, 2 mmm. crasso, hyalino.

III. Soris teleutosporiferis hypophyllis, in maculis minutis nigro-brunneis, brunneo-atris, rotundis v. irregularibus, ad 1 mm. diam., erumpentibus, pulverulentis. Teleutosporis ellipticis, ad 45–55 × 20–26 mmm.; apice rotundato v. acuminato, non v. leniter (3 mmm.) crassato, basi attenuato, ad septum constricto; episporio leve, 1·5–2 mmm. crasso, castaneo, contentu vacuolato; pedicello deciduo, hyalino, ad 25×8 mmm.; foramine germinis cellulare superioris apicale, foramine basili ad $\frac{1}{3}$–$\frac{2}{3}$ infra septum, conspicuo papillato.

X. Mesosporis raris, obovatis, ad 29–40 × 16–23 mmm.

Hab.: In foliis vivis *Oleariae Cunninghamii* Hook. f. I–III. York Bay, Wellington, New Zealand, 100 m. *E. H. Atkinson.*

Uredo Forsterae forma sp. nov. (Fig. 130.)

II. Uredosoris hypophyllis, in irregularibus maculis flavis, raris, ellipticis, ad 1–2 mm. longis, castaneis, bullatis, pulverulentis, epidermide rupta cinctis. Uredosporis globosis v. obovatis, ad 24–31 × 18–25 mmm.; episporio subtiliter echinulato, castaneo, 1·5–2 mmm. crasso, cum 2–3 foraminibus germinis in circulo aequinoctialis, indistinctis.

Hab.: In foliis vivis *Forsterae Bidwillii* Hook. f. II. Mount Egmont, Taranaki, New Zealand, 1,000 m. *E. H. Atkinson.*

LIST OF SPECIES AND HOSTS DISCUSSED HEREIN.

Species.

Puccinia Caricis *Schroet.*
Puccinia fodiens *G. H. Cunn.*
Puccinia graminis *Pers.*
Puccinia heketara *G. H. Cunn.*
Puccinia Hoheriae *Wakef.*
Puccinia Hoheriae G. H. Cunn.
Puccinia novae-zelandiae *G. H. Cunn.*
Puccinia pulverulenta *Grev.*
Puccinia tiritea *G. H. Cunn.*
Puccinia Unciniarum *Diet. et Neg.*
Uredo Forsterae *G. H. Cunn.*
Uromyces Edwardsiae *G. H. Cunn.*

Hosts.

Agropyron scabrum (*Lab.*) *Beauv.*
Carex appressa *R. Br.*
Celmisia spectabilis *Hook. f.*
Edwardsia tetraptera (*J. Miller*) *Oliver.*
Epilobium junceum *Sol.*
Epilobium pictum *Petrie.*
Epilobium pubens *A. Rich.*
Forstera Bidwillii *Hook. f.*
Muehlenbeckia axillaris (*Hook. f.*) *Walp.*
Olearia arborescens (*Forst. f.*) *Cockayne and Laing.*
Olearia avicenniaefolia (*Raoul*) *Hook. f.*
Olearia Cunninghamii *Hook. f.*
Olearia nitida Hook. f.
Poa aquatica *L.*
Sophora tetraptera J. Miller.
Uncinia australis *Pers.*

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